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BIOLOGICAL EVALUATION OF THE SOUTHERN PINE BEETLE ON THE BANKHEAD NATIONAL FOREST

by

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INTRODUCTION

A biological evaluation was conducted on the Bankhead National Forest, Bankhead and Black Warrior Districts, National Forests in Alabama, the week of February 26, 1979. The purpose of the evaluation was to determine the status of the southern pine beetle (Dendroctonus frontalis Zimmerman) populations in the area and to determine what action, if any, should be taken in FY 79.

METHOD OF EVALUATION AND ANALYSIS OF SPB INFESTATION

Aerial Survey

Standard aerial sketch map procedures were used for this evaluation, except that survey coverage was 100 percent. District personnel made the survey[2/] and spots of red and/or fading trees were recorded and plotted on Forest Service Class A maps. The Alabama Forestry Commission also made a survey of private lands at this time.

Evaluation Procedures

There is no technology available for evaluating future SPB losses based on the winter population of the SPB life cycle. Therefore, no quantitative measure of SPB populations was taken. Spots were ground checked to determine presence or absence of SPB within the infestations. Brood stages within infested trees were determined by felling trees within spots to examine the upper bole. The winter SPB population usually is found higher on the bole of the infested tree than during other times of the year. Historical data from previous SPB control projects on the Bankhead National Forest will be used in part to correlate amount of damage found at the time of this report and losses expected during the summer of 1979.

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2/ Detection of Forest Pests in the Southeast, 1970. USDA, USFS, Southeastern Area, State and Private Forestry, Publ. S&PF-7, Atlanta, Ga.

RESULTS AND DISCUSSION

Twenty-seven infestations were found on the Black Warrior District ranging in size from 5 to 250 trees. The Bankhead District had 31 spots of red and/or fading trees ranging from 1 to 15 trees (see table 1 for spot size distribution).

Twelve spots were ground checked on the Black Warrior District and eight spots were ground checked on the Bankhead District (table 2). These spots were selected to represent the status of the outbreak on each district.

All brood stages were found in all spots. The winter populations of the SPB have not started their spring dispersal,[3] thus the infestations are higher on the bole and exhibit a slower rate of spot growth. The fact that all life stages were found in the trees which were felled further indicates that the SPB has not yet started spring dispersal.

Large overwintering spots with many active trees can produce higher losses after the dispersal phase of the SPB life cycle is complete. A previous report, No. 73-2-20[4], found a condition similar to that currently existing on the Bankhead National Forest. The 1973 population was estimated to quadruple the winter damage during the spring and summer seasons. The 1973 prediction was more than fulfilled the first 3 months with 912 MBF and 657 Cunits reported salvaged during April, May, and June. Expansion of the SPB population during the spring and summer of 1979 is expected to follow a pattern similar to that experienced in 1973.

The potential for further losses from this overwintering SPB population is directly related to the amount of susceptible timber found on the forests. A total of 40,138 acres of loblolly, shortleaf, and Virginia pine are in age classes > 40 years old. Research has shown this age class to be susceptable to loss due to declining vigor. Virginia pine, which has been shown to be the most heavily attacked of the three species above, has 5,110 acres in the above category.[5] Red heart disease (Phellinus pini "Thore-Ex-Fr" A. Ames) was present in a

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[3] Southern Pine Beetle Seasonal Habits in East Texas Forests. Texas Forest Service Circ. No. 228.

[4] Evaluation of Southern Pine Beetle Infestations on the Bankhead national Forest, Alabama. May 1973. USDA, For. Serv., Southeastern Area, State & Private Forestry, Report No. 73-2-20.

[5] Data from the Continuous Inventory of Stand Conditions (CISC).

Table 1. -- SPB spot size distribution - Aerial Survey

Black Warrior R.D.		Bankhead R.D.
Size Class	# Spots	# Spots
4 - 10	5	12
11 - 25	5	10
26 - 50	10	4
51 - 100	2	1
101 - 200	5	2
> 200	1	0

Table 2. SPB ground check information

	Black Warrior R. D.			Bankhead R. D.		
Size Class	# Spots ground checked	# Trees inactive	# Trees active	# Spots ground checked	# Trees inactive	# Trees active
5-10	2	2	10	1	4	3
11-25	2	27	6	1	18	5
26-50	4	85	49	2	57	22
51-100	1	45	12	2	160	24
101-200	2	250	41	2	179	61
> 200	1	208	50	0		

number of infested stands which were visited. This disease is an indicator of overmature stands. These stands are particularly susceptible to SPB losses. Littleleaf disease (Phytophthora cinnamomi Rands) was also noted in 9 of the 20 stands visited. Littleleaf sites have been shown to support pine which is susceptible to SPB attack.[6/]

Based on the ground check data, previous historical data, presence of diseases and active SPB infestations found on private land by the Alabama Forestry Commission, damage from SPB infestations should increase beyond their present status. Using spot growth formulae, the volume protected for existing spots was calculated to be 192 MBF (see benefit/cost analysis).

RECOMMENDATIONS

The Bankhead National Forest should initiate a SPB control project. High overwintering SPB populations and a large acreage of susceptible host type can lead to extensive losses once spring dispersal of the SPB begins. Large, overwintering spots still exhibiting spot growth should be treated first. This will reduce losses since spot growth increases with the size of the spots. There is insufficient technology to make accurate predictions about SPB population increases based on the winter mode of the life cycle. A better measure of population trend should be attempted once the spring dispersal cycle is over. Then the project can be amended using better population estimates.

The Bankhead National Forest should treat all spots found in the high and medium hazard classes (see project control plan for this project). Salvage control will minimize losses and prevent spot growth by removing infested material from the forest. Chemical suppression and/or cut-and-leave tactics are recommended only for inaccessible spots or for unmerchantable timber that cannot be treated any other way. Forest Insect and Disease Management, Pineville, Louisiana, should be contacted prior to the use of chemical control for an update on the latest restrictions or application procedures. Cut-and-leave is a summer treatment only, and is recommended for spots < 40 trees.

All suppression activity should be done in accordance with the 3400 section of the FSM, and the project control plan for the forest.

6/ Belanger, R. P., G. E. Hatchell, and G. E. Moore. 1978. Soil and Stand Characteristics Related to SPB Infestations: A Progress Report for Georgia and North Carolina.

Prevention of future losses by both districts can be accomplished by making an effort each year to identify problem areas (FI&DM will aid in this) and treat them silviculturally to either remove or lessen SPB hazard on a stand by stand basis. The compartment prescriptionist can aid in the prevention effort by identifying problem areas and addressing these areas on the compartment prescritpion ("other" section of the R-8 2400-40 form). Stand improvement should be accomplished by thinning or harvesting older, dense stands as heavily as R-8 guidelines allow.

If stands must be deferred, the youngest and least dense stands should be left. Here are some factors the prescriptionist should consider for reducing SPB hazard:

1) Are the site and species well matched? If not, consider hardwood for the next rotation.

2) Is the site a littleleaf site? If so, then SPB could become a problem. Change to another species of pine if the site is such that you can do so. Otherwise, convert to hardwood.

3) Is the site an annosus root rot site? If so, it is susceptible to SPB attack.

   A. Don't thin, (if loblolly) use wider spacing when planting.

   B. Plant longleaf or convert to hardwood, if appropriate.

4) Alter stand density -- avoid basal areas in excess of 120 ft^2/ acre.

5) Remove high risk trees (if operable).

6) Reduce man-caused disturbances.

All of these factors can be influenced by the prescription. Good forest management is the best way to reduce future SPB losses.

For further information, contact FI&DM, Pineville Field Office, Pineville, Louisiana 71360, FTS 497-3311, Commercial 318-445-6511, Ext. 311.